

Section 1 Introduction

1.1 *Framework*

This section introduces the purpose, goals, objectives, and efforts of the City of San Diego (City) to protect and improve the surface water quality of the Mission Bay Watershed Management Area (WMA).

1.1.1 Program Purpose

The purpose of the Mission Bay Watershed Urban Runoff Management Program (WURMP) is to guide the City's efforts to protect and improve the surface water quality of Mission Bay, the La Jolla coast, San Clemente Creek, Rose Creek, and Tecolote Creek. More specifically, the WURMP addresses issues related to surface water quality within the Mission Bay WMA that can be potentially attributed (wholly or partially) to discharges from the municipal separate storm sewer system (MS4), which is also referred to as the storm drain system. Urban runoff, either from precipitation or human activity, conveys pollutants through the MS4 and directly into local water bodies, contributing significantly to their degradation.

1.1.2 Program Development

Development of the WURMP is based on an iterative process of data collection and analysis, program planning, activity implementation, and activity and program assessment. The City, both by itself and in cooperation with other jurisdictions in the region, collects and analyzes data pertaining to water quality and pollutant sources to determine and prioritize the prevalent problems in the WMA, the sources or causes of those problems, and the site of those problems. Using this information, the City then identifies, plans, and implements activities to effectively address the worst problems in the most critical areas of the WMA. These activities are assessed for their effectiveness in conjunction with assessment of the WURMP as a whole on a periodic basis. The City adds the assessment data to the updated water quality and pollutant source data to refine its future WURMP management decisions and efforts.

The Storm Water Pollution Prevention Division in the General Services Department leads the City's efforts to reduce urban runoff pollution. It consists of staff from various disciplines working together to develop and implement the WURMP. In addition to City staff, stakeholders participate regularly in activity planning and implementation efforts regularly via meetings at the City or at stakeholder locales. Because the City is the only Copermittee within the WMA, internal and stakeholder meetings are held at an ad hoc basis.

1.1.3 Order No. R9-2007-0001

The WURMP closely adheres to Section E of San Diego Regional Water Quality Control Board Order No. R9-2007-0001, National Pollutant Discharge Elimination System Permit No.

CAS0108758¹ (Municipal Permit). Section E (and other sections) of the Municipal Permit outlines a vision for managing urban runoff pollution at the watershed level, which includes:

- Identifying the WMA's high priority water quality problems and their sources/causes
- Conducting an annual assessment of the WMA's water quality
- Characterizing the sources/causes of the WMA's high priority water problems
- Planning, implementing, and assessing activities to address the WMA's high priority water quality problems and their sources
- Collaborating with other jurisdictions in the WMA to address the high priority water quality problems and their sources/causes
- Assessing the effectiveness of the WURMP as a whole
- Coordinating and integrating Total Maximum Daily Load (TMDL) efforts into WURMP efforts

1.1.4 Program Goal and Objectives

The primary goal of the WURMP is to positively affect the water quality of the Mission Bay WMA while balancing economic, social, and environmental constraints. The following objectives have been identified by the City to achieve this goal:

- Develop and expand methods to assess and improve the water quality within the WMA
- Integrate watershed principles into land use planning
- Enhance public understanding of the sources or causes of urban runoff pollution
- Encourage and develop stakeholder participation in the development and implementation of the WURMP

1.2 Watershed Description

This section describes the Mission Bay WMA to contextualize the City's efforts to protect and improve the surface water quality of the WMA.

1.2.1 Geography

The geography of the Mission Bay WMA features: four main water bodies; canyons and wildlife preserves; a coastline with steep bluffs and sandy and rocky beaches; salt marshes; mesas; and desert. San Clemente Creek, Rose Creek, and Tecolote Creek flow into Mission Bay. Mission Bay itself is a system of islands, peninsulas, beaches, remnant salt marshes, and a navigable inlet to the Pacific Ocean, whose current configuration is largely the result of dredging of tidal salt marshes and mudflats. Wildlife preserves include the Tecolote Canyon Natural Park, the Rose Canyon Open Space Preserve, and the Marian Bear Memorial Natural Park. Steep bluffs line the La Jolla coast as well as both sandy and rocky beaches. Mesas can be found in the University of California, San Diego area and surrounding communities. Desert habitat is featured in the Miramar Marine Corps Air Station area.

¹ http://www.swrcb.ca.gov/rwqcb9/programs/sd_stormwater.html

1.2.2 Biology

Mission Bay provides habitat for numerous sensitive species indigenous to the Southern California coastline and is home to several wildlife preserves that provide important habitat for the federally endangered least tern, brown pelican, and light-footed clapper rail. Tecolote Canyon Natural Park, the Rose Canyon Open Space Preserve, and the Marian Bear Memorial Natural Park also provide habitat for a variety of both animal and plant species, including riparian and chaparral vegetation, such as willows and coastal sage scrub.

1.2.3 Hydrology and Beneficial Uses

The Mission Bay WMA is the smallest WMA in the San Diego region with a land area of over 43,000 acres. It is fully within the jurisdiction of the City. Three hydrologic areas (HA) form the WMA:

- Scripps HA (906.3)
- Miramar HA (906.4)
- Tecolote HA (906.5)

Together with the Miramar Reservoir HA (906.1) and the Poway HA (906.2), the Mission Bay WMA forms the Peñasquitos Hydrologic Unit (906.0).

The Miramar and Tecolote HAs drain directly into Mission Bay via Rose and Tecolote creeks, respectively. The Scripps HA drains into the Pacific Ocean along the coastlines of the communities of Pacific Beach and La Jolla.

The Water Quality Control Plan for the San Diego Basin (Basin Plan) lists the following existing and potential beneficial uses for the main water bodies of the WMA:

- Mission Bay: IND, REC1, REC2, COMM, EST, WILD, RARE, MAR, MIGR, SPWN, SHELL
- Rose Creek: IND, REC1, REC2, WARM, WILD
- Tecolote Creek: REC1, REC2, WARM, WILD
- San Clemente Creek: IND, REC1, REC2, WARM, COLD, WILD, RARE, SPWN

1.2.4 Land Use

The Mission Bay WMA contains some of the more intensely urbanized areas of San Diego County (the San Diego Association of Governments estimated the population of the WMA to be 226,446 in 2000). Residential uses predominate in the Scripps and Tecolote HAs and in the southern portion of the Miramar HA. The Miramar Marine Corps Air Station and the University of California, San Diego, occupy the northern portion of the Miramar HA. Mission Bay, the largest aquatic park along the western coast of the United States, is the outstanding land use at the southwestern corner of the WMA. It supports a variety of recreational uses and a small amount of remnant salt marshes. Commercial and industrial land uses are clustered generally along Interstate 5 and in the Golden Triangle area (bounded by Interstate 805, State Route 163,

and State Route 52). Wildlife preserves and parks run along San Clemente, Rose, and Tecolote creeks.

Table 0-1 below summarizes the land uses in the WMA in terms of acreage and percentage of the WMA as a whole.

Table 0-1. Mission Bay WMA Land Uses².

Land Use Category	Acreage	Percentage of WMA
Residential	14,584	33.68
Commercial/office	1,892	4.37
Industrial	972	2.24
Public facilities/utilities	7,056	16.30
Parks/recreation/open space	10,123	23.38
Agriculture	68	0.16
Undeveloped	6,553	15.14
Water bodies	2,050	4.73
Total	43,298	100.00*

*Does not add up to 100 due to rounding

1.2.5 Jurisdictions

The Mission Bay WMA is fully within the City's jurisdiction; therefore, the City is the only Copermittee within the WMA. However, significant military presence is located in the eastern part of the WMA as well as the University of California, San Diego, just east of La Jolla. The following map of the WMA includes the following features to facilitate activity planning and implementation efforts:

- Receiving waters
- Clean Water Act Section 303(d) impaired receiving waters
- Land uses
- MS4
- Major highways
- Inventories commercial, industrial, and municipal sites

INSERT WATESHED MAP HERE GRAPHICALLY PRESENTING INFO DESCRIBED ABOVE.

² Sources include SANDAG Year 2000 digital imagery and City of San Diego water utilities digital orthophotos, jurisdictional land use data, and various secondary sources used to verify land use interpretations. Data were tabulated by SANDAG as a courtesy to Municipal Permit Copermittees.

Section 2 Watershed Strategy

In spring 2006, the City initiated efforts to proactively address present and anticipated Total Maximum Daily Load (TMDL), Area of Special Biological Significance (ASBS), and Municipal Permit WURMP requirements using an integrated approach to maximize resources and achieve efficiencies. The result of these efforts has been the Strategic Plan for Watershed Activity Implementation (July 2007) (Strategic Plan)¹, the preparation of which involved reviewing and assessing available monitoring and source data, land use data, and current and anticipated regulatory drivers to determine the priority water quality problems for the WMAs that the City has jurisdiction in and geospatially prioritize the City's portion of each of those WMAs, using best professional judgment, for activity implementation.

Subsequent to the adoption of the Municipal Permit in January 2007, the Copermittees developed a Model Watershed Strategy to help guide their planning, implementation, and assessment efforts in the various WMAs. The Model Watershed Strategy assists the Copermittees in: prioritizing areas within each WMA; selecting and prioritizing appropriate watershed activities and monitoring and pollutant source identification studies for each of those prioritized areas; and identifying data gaps with regards to monitoring and pollutant sources, which need to be filled to enable more refined future management decisions.

Although developed independently of each other, City's Strategic Plan and the Copermittees' Model Watershed Strategy share the approach of reviewing the best available data (e.g., water quality and pollutant source data) and analyzing them geospatially to make management decisions regarding: (1) water quality problems to target and activities to implement; and (2) geospatial prioritization of the WMAs for focused activity implementation.

This section outlines the different components of the Model Watershed Strategy and how they and the Strategic Plan have been integrated for the Mission Bay WMA.

2.1 Planning

This section outlines the planning component of the Model Watershed Strategy and the results for the Mission Bay WMA using the data and analysis found in the Strategic Plan.

2.1.1 Baseline Watershed Evaluation

The Baseline Watershed Evaluation (BWE) of the Model Watershed Strategy involves the verification of Baseline Long-Term Effectiveness Assessment (BLTEA) water quality priority ratings using additional monitoring and pollutant source identification data collected since the formulation of those ratings in January 2007. Verification is necessary, especially at the Hydrologic Area (HA) and Hydrologic Sub-Area levels, because ratings for downstream areas (for which data are, in general, more abundant) are extrapolated and assigned to upstream areas lacking data. Upstream areas identified as impaired for bacteria because of data from downstream areas, for example, may in fact be not so. Such areas with BLTEA water quality

¹ <http://www.strategy.com>

priority ratings based on extrapolation should, therefore, not be targeted for load reduction and source abatement activities until the Copermittees are more certain that bacteria is indeed a problem there. The BWE directs the Copermittees to determine, using geospatial analysis and best professional judgment, whether there are adequate data to make meaningful management decisions regarding the implementation of load reduction or source abatement activities. If data are inadequate (whether on the monitoring or source identification side), then those data gaps should be filled by instituting appropriate monitoring or source identification studies. If the data are adequate, then meaningful management decisions regarding whether or not to implement load reduction or source abatement activities can be made². Thus, the BWE simultaneously: identifies data gaps; identifies where load reduction and source abatement activities should be implemented for specific water quality problems, thereby prioritizing areas of the WMA for watershed activity implementation; and identifies the high priority water quality problems of the WMA, which essentially are the ones that the Copermittees have adequate data on to warrant implementation of load reduction and source abatement activities.

For the Mission Bay WURMP, the City has used the data and analysis in its Strategic Plan to populate a modified version of the Hydrologic Area Action Matrix of the Model Watershed Strategy. The Strategic Plan focuses on the Tecolote HA and the La Jolla Shores area within the Scripps HA with regards to data review and assessment and activity implementation recommendations. The City decided to specifically focus on these two areas because of pending TMDL and current ASBS requirements applicable to those areas, in addition to present WURMP requirements. Based on the City's best professional judgment, there are adequate data (both monitoring and pollutant source) to justify implementing load reduction and source abatement activities in these areas, while simultaneously conducting additional monitoring and pollutant source characterization studies to further refine its knowledge of the Mission Bay WMA. [Table 0-1](#) summarizes the water quality problems for the Scripps and Tecolote HAs in the Mission Bay WMA that the City will be addressing via load reduction/source abatement activities and further monitoring and pollutant source characterization studies:

Table 0-1. Hydrologic Area Action Matrix for Mission Bay WMA.

HA / Constituent or Stressor Group	Heavy Metals	Dissolved Minerals	Organics	Oil and Grease	Sediments	Pesticides	Nutrients	Gross Pollutants	Bacteria	Benthic Alterations	Toxicity
Scripps	★				★		★		★		
Tecolote	★				★		★		★		

Instead of presenting actions (monitoring, source characterization, or load reduction/source abatement activities) for each water quality problem based on the results of the BWE, the City has modified the Hydrologic Area Action Matrix of the Model Watershed Strategy to indicate the water quality problems that its Strategic Plan recommends for both load reduction/source abatement activities and further monitoring and pollutant source characterization studies. The Strategic Plan does not consider activities/studies to be mutually exclusive with regards to

² However, according to the Municipal Permit, the Copermittees must ensure that at least two load reduction and/or source abatement activities are in active implementation per fiscal year regardless of the results of the BWE.

implementation. In fact, carefully planned activity implementation itself can serve to contribute to monitoring data and pollutant source characterization through the associated data gathering needed to implement and assess the effectiveness of activities.

2.1.2 Activity Identification and Evaluation

In addition, the Strategic Plan develops and presents the City's "tiered" approach to aid in the identification and selection of appropriate activities to address identified priority water quality problems. The Strategic Plan categorizes activities into tiers according to type, effectiveness, and implementation feasibility and cost. In general, Tier I activities address water quality problems closer to the source, are more effective, non-structural, and easier and less expensive to implement than Tier II and then Tier III activities. The Strategic Plan calls for the maximization of Tier I activity implementation before Tier II, with Tier III activities as the last resort. It makes recommendations on the activities to implement over a five-year period based on the identified water quality problems and pollutant source data available per watershed.

The City's Strategic Plan conforms with and complements the Model Watershed Strategy's Activity Identification and Evaluation (AIE) component. Once the appropriate actions are determined, the Model Watershed Strategy assists the Copermittees in identifying potential watershed activities to implement and evaluate for feasibility and projected effectiveness. This AIE is conducted with the aid of the Pollutant Impact Table and Standard Activities List Table. The Pollutant Impact Table describes pollutants and their impacts on water quality, identifies implementation approaches, and discusses the advantages and disadvantages of using each approach. The Standard Activities List Table contains general information on broad categories of activities and provides an overview of how each activity category is used, the pollutant(s) that it addresses, its probability for success, and the potential impact gained by implementation. Much of the information presented in these tables is also found in the City's Strategic Plan. For example, the Strategic Plan presents an activity implementation and evaluation approach and provides information on various activities. Although the City is using primarily its Strategic Plan to identify activities for the Mission Bay WMA to address the results of the BWE, the tiered approach does not conflict with the AIE process of the Model Watershed Strategy and complements it in spirit.

2.2 Implementation

This section outlines the implementation component of the Model Watershed Strategy and the results for the Mission Bay WMA.

2.2.1 Activity Selection and Prioritization

The City has used its Strategic Plan to select and prioritize its activities in FY 2008 for the Mission Bay WMA. Tentative activities for FY 2009 through FY 2013 are also identified, but may be modified as new data and other information warrants. The City will provide an updated list of activity each year through the annual report process.

Information regarding each activity is recorded using a standard Activity Summary Sheet collectively developed by the Copermittees and integrated into the Model Watershed Strategy.

The compilation of these Activity Summary Sheets constitutes the five-year strategic plan for the WMAs. For the five-year strategic plan for the Mission Bay WMA, refer to Section 4 of this WURMP.

2.2.2 Activity Implementation Schedule

The Model Watershed Strategy directs the Copermittees to determine an implementation schedule for each activity selected. Section 4 of this WURMP presents information on the City's activity implementation schedule for the Mission Bay WMA based on its Strategic Plan.

2.3 Assessment

For the effectiveness assessment of the City's efforts for the Mission Bay WMA, refer to Section 5 of this WURMP. The City has developed a series of key management questions that, when answered through program effectiveness assessment, will assist the City's efforts in maximizing the effectiveness of the Mission Bay WURMP.

3 Section 3 Water Quality Assessment

This section describes the approach to assess the conditions of the receiving waters of the Mission Bay WMA, identify the WMA's water quality problems, and identify the likely sources/causes of those water quality problems. The purpose of the water quality assessment is to make possible management decisions that focus resources on the highest water quality problem priorities in the most problematic areas using the best known approaches.

3.1 Water Quality Assessment Approach

3.1.1 Data

The monitoring programs that the Copermittees are engaged in can be divided into three major categories: Regional Monitoring, Core Monitoring, and Process Studies.

Regional Monitoring encompasses large spatial areas and look at many elements potentially impacted by urban runoff. It takes a longer-term view of the ultimate receiving waters, coastal bays, lagoons, and the Pacific Ocean. Regional Monitoring is designed to answer questions concerning broad ecological health and encompasses numerous components, including water and sediment quality, fish, benthos, birds, etc. Examples of Regional Monitoring include:

- Southern California Bight
- Southern California Coastal Waters Research Project

Core Monitoring refers to several long-term monitoring activities conducted by the Copermittees on an annual (or more frequent) basis. These activities are more focused, concentrates on fewer parameters than Regional Monitoring efforts, and services to provide data to assess long-term trends within and across WMAs. The Copermittees have designed these monitoring programs under an adaptive strategy that is subject to review as warranted by new data or information. Examples of Core Monitoring include:

- Mass Loading Station
- Dry Weather
- Coastal Storm Drain Outfall
- MS4 Outfall
- Ambient Bay, Lagoon, and Coastal Receiving Water
- Urban Stream Bioassessment
- Cleanup and Abatement Order

Process Studies supplement both Regional and Core monitoring activities. They are short-term evaluations designed to answer specific questions. Examples include:

- Pollutant source identification and characterization
- DNA ribotyping
- Storm water discharge and toxicity link

3.1.2 Water Quality Problems

The Copermittees use the data and findings resulting from the above monitoring programs to identify the priority water quality problems within each WMA. As a way to integrate all of the data and findings into one comprehensive finding, the Copermittees have developed the Threat to Water Quality (TTWQ) rating using a methodology described in the Baseline Long-Term Effectiveness Assessment (BLTEA). This system rates per specific constituent/stressor the threat level of a particular source to the water quality of a specific WMA, combining source and monitoring information.

To determine the priority water quality problems and the high priority water quality problems for each WMA, the Copermittees have decided to use the latest available alphabetic “water quality priority ratings” (presented in the 2005–2006 Annual Monitoring Report) determined using the methodology in the BLTEA.

For the Mission Bay WMA, each constituent/stressor group that received an A or B rating is identified as a priority water quality problem. Each constituent/stressor group that both received an A rating *and* has a 303(d) listed water body for it is identified as a high priority water quality problem.

Note that, once the priority and high priority water quality problems have been identified, they are set until the Municipal Storm Water Permit is re-issued again by the Regional Board. Only major, unforeseen events that the Copermittees judge to be sufficiently significant would prompt a modification to the list of high priority water quality problems.

3.2.1 Annual Water Quality Assessment

To assess annually the water quality of the WMAs, the Copermittees have been compiling the *San Diego County Municipal Copermittees Urban Runoff Monitoring Report* (Annual Monitoring Report). The Annual Monitoring Report presents data and findings from the various Regional Monitoring, Core Monitoring, and Process Studies programs implemented throughout the region by the Copermittees. In particular, it follows a methodology to determine which constituents during the reporting period have a high, medium, or low frequency of occurrence or exceedances. Diamonds are used (three for high, two for medium, and one for low) to graphically represent the ratings. The Copermittees are able to use the diamond rating to monitor trends in exceedances and take action accordingly. The diamond rating will continue to be used by the Copermittees to assess the water quality of each WMA annually.

3.2 Receiving Waters Condition

As of the 2005–2006 municipal urban runoff monitoring season, for the Tecolote Creek sub-watershed, which accounts for approximately 14% of the Mission Bay WMA, the primary land uses within the contributing runoff area are residential (43%) and transportation (21%). For the Mission Bay WMA, turbidity, total coliform, fecal coliform and enterococcus were identified as high frequency of occurrence COCs followed by TSS and the total metal lead, which was identified as a medium frequency of occurrence COC. A review of the scatterplots and trends

indicate significant downward trends for surfactants, ammonia, Diazinon, and total lead concentrations. A significant increasing trend for enterococci was also observed.

Third party data under the SWAMP program in 2002 was collected at two sites within the Mission Bay Watershed: one in Tecolote Creek near the mass loading station and the other in Rose Canyon Creek. Constituents with results above the water quality objective (WQO) include sulfate, manganese and toxicity at the Tecolote Creek station. Constituents with results above the WQO at Rose Canyon Creek included sulfate, manganese, turbidity, pH, Diazinon and toxicity.

The constituent EMC loads at the Tecolote Creek MLS site were compared to the mean water quality objective (WQO) load, calculated by multiplying the mean flow by constituent WQOs. This comparison shows that fecal coliform, TDS, TSS, total copper, and total lead mean EMC loads were greater than their corresponding mean WQO loads. These results correspond to the EMC exceedances reported in the wet weather chemistry tables, except for TDS. Total dissolved solids was not above the water quality objective for any one wet weather sampling event, but due to the volume of storm water runoff the mean EMC load was 213 kg/day greater than the WQO load. This is 0.32% greater than the WQO load, a negligible amount. Fecal coliform EMC load results were an order of magnitude greater than the WQO load, while loads for total copper and total lead were less extreme.

The mean modeled loads calculated in GIS for the Mission Bay Watershed indicate that loads of total suspended and total dissolved solids based on measured concentrations are higher than might be expected from the land use characteristics in the Tecolote Creek Watershed.

Two stream bioassessment monitoring sites were sampled in the Mission Bay WMA. One site was in Rose Creek, downstream of Highway 52, and the other site was in Tecolote Creek in Tecolote Canyon Natural Park. The macroinvertebrate community of both sites had Index of Biotic Integrity ratings of Poor in October and Very Poor in May, with substantial seasonal variation in the total IBI scores. Based on the Ambient Bay and Lagoon Monitoring Program for 2005, Mission Bay scored good for toxicology, biology and chemistry.

In addition to the WMA assessment findings, the water quality priority ratings found high priority (A) ratings for the heavy metals, dissolved minerals, nutrients, bacteria, and toxicity categories but found a B priority rating for the sediments category. The heavy metals priority rating found in the water quality priority rating was primarily due to the 303(d) listings for metals in the Miramar and Tecolote subwatersheds even though the WMA assessment did not indicate metals were a high frequency constituent of concern.

3.3 Water Quality Problems

This section outlines the water quality problems identified by the City to be targeted. The recommendations in the City's Strategic Plan are in harmony with the identification below.

3.3.1 Priority Water Quality Problems

The City has determined the following constituent/stressor groups (with water quality priority ratings) as priority water quality problems in the Mission Bay WMA per the methodology

described above in Section 3.1.2 and based on the findings of the 2005–2006 Annual Monitoring Report:

- Heavy Metals (A)
- Dissolved Minerals (A)
- Sediments (B)
- Nutrients (A)
- Gross Pollutants (B)
- Bacteria/Pathogens (A)
- Toxicity (A)

3.3.2 High Priority Water Quality Problems

Of the list above, the City has determined the following constituent/stressor groups as high priority water quality problems in the Mission Bay WMA because they have 303(d) listed water bodies impaired for them in addition to having an A rating:

- Heavy Metals
- Nutrients
- Bacteria/Pathogens

The City is not designating toxicity as a high priority water quality problem because of the challenges of addressing sources/causes at this time.

3.4 Likely Pollutant Sources

[Table 3-1](#), below lists the likely pollutant sources per the BLTEA for each of the high priority water quality problems identified in Section 3.3.2 above.

Table 3-1. Likely Pollutants Sources of High Priority Water Quality Problems in Mission Bay WMA.

High Priority Water Quality Problem	Likely Sources per BLTEA
Heavy Metals	Auto mechanical repair, maintenance, fueling, or cleaning; automobile and other vehicle body repair and painting; botanical or zoological gardens and nurseries/greenhouses; fabricated metal; motor freight; boat mechanical repair, maintenance, fueling, or cleaning
Nutrients	Animal facilities; botanical or zoological gardens and nurseries/greenhouses; landscaping (e.g., parks, golf courses, cemeteries, etc.); pest control services; home automobile–associated activities, home and garden care activities, waste disposal; roads, streets, highways, and parking facilities; parks and recreation facilities
Bacteria/Pathogens	Eating/drinking establishments; animal facilities; landscaping (e.g., parks, golf courses, cemeteries, etc.); publicly owned treatment works (water and wastewater); home automobile–associated activities, home and garden care activities, waste disposal

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Section 4 Plan of Action

This section presents the City's five-year strategic plan to address the high priority water quality problems identified in Section 3.3.2. Based on the results of the Collective Watershed Strategy for the Mission Bay WMA in Section 2.1.1, load reduction and source abatement activities should be implemented in the Scripps and Tecolote HAs for the following constituent groups: heavy metals, nutrients, and bacteria. [Table 0-1](#) below summarizes the activities of the five-year strategic plan.

Table 0-1. Summary of Five-Year Strategic Plan.

Activity Type / ID Number / Name			Anticipated Implementation Year	Participating Stakeholder(s)	Water Quality Problem(s) Addressed	Status
Water Quality	MB-1001	ASBS-Tecolote Targeted Street Sweeping	FY 2008	City of San Diego	Heavy Metals	Planning
	MB-1002	Mt. Abernathy Green Street LID Project	FY 2008	City of San Diego	Bacteria	Implementation
	MB-1003	Targeted Restaurant Inspections	FY 2009	City of San Diego	Nutrients	Assessment
			FY 2009		Sediment	Complete
			FY 2010		Toxicity	Ongoing
			FY 2010			Cancelled
Education	MB-2001	Admobile				
	MB-2002	Radio				
	MB-2003	Print				
	MB-2004	Television				Cancelled
Special Studies	MB-3001	Tecolote Creek Bacterial Source ID Study			Bacteria	Complete
	MB-3002	Mission Bay Eelgrass Bacterial Source ID Study			Bacteria	Ongoing
Public Participation	MB-4001	San Diego Coastkeeper			All	Ongoing
	MB-4002	Independent Rates Oversight Committee			All	Ongoing
	MB-4003	Mission Bay Park Committee			All	Ongoing
					All	
					All	
Land Use	MB-5001	LJ Community Plan			All	Implementation
	MB-5002	LJ Shores Coastal Watershed Management Plan			All	Implementation
					All	
					All	
					All	

4.1 Proposed Water Quality Activities

Refer to Appendix XXX for the Activity Summary Sheets describing the City's proposed watershed water quality activities and details regarding their anticipated implementation schedule.

4.2 Proposed Education Activities

Refer to Appendix XXX for the Activity Summary Sheets describing the City's proposed watershed education activities and details regarding their anticipated implementation schedule.

4.3 Proposed Public Participation Activities

The City will continue to actively encourage the participation and input of diverse stakeholders in the development, implementation, and assessment of the Mission Bay WURMP. Historically, stakeholders have participated regularly in activity planning and implementation efforts via meetings at the City or stakeholder locales. Because the City is the only Copermittee within the WMA, internal and stakeholder meetings are held at an ad hoc basis. The paragraphs below broadly outline the public participation strategy that the City will be pursuing to encourage stakeholder engagement in the WURMP. Specific public participation activities as conducted will be reported in the annual reports to be appended to this WURMP.

4.3.1 Non-Governmental Organization Engagement

The City will continue to engage non-governmental organizations (NGOs) active in the WMA in the development, implementation, and assessment of the Mission Bay WURMP through a variety of means, including, but not limited to:

- Entering into agreements with NGOs to implement activities, such as trash/debris sponsorships, creation and distribution of education materials, workshop facilitation, research, community events, and presentations
- Inviting NGO representatives to the City and sending City representatives to NGO meetings to discuss urban runoff pollution prevention efforts, share input, and identify opportunities for coordination
- Partnering with NGOs as appropriate in advocating legislation protective of water quality

4.3.2 Outreach

The City will continue to conduct outreach to the public on its own and in coordination with NGOs as described above. Outreach efforts may involve, but not be limited to, the following:

- Presence at community events, e.g., booths, trash/debris cleanup teams, delegates
- Presentations and talks at stakeholder events/meetings
- Workshops targeting specific audiences/pollutant sources
- Participation in ad hoc committees

4.3.3 Independent Rate Oversight Commission

The Independent Rate Oversight Commission (IROC) will assume and expand upon the role formerly played by the City's Public Utilities Advisory Commission (PUAC). The IROC will replace the PUAC as the venue used to review changes in budgets and the scope of projects being proposed for the water and wastewater systems, including storm water. The IROC, composed of various members of the community, will provide the City not only with rate oversight, but also policy recommendations on storm water and urban runoff issues. Meetings will be open to the public, and resulting policy/action recommendations will be forwarded to the Mayor's Office and City Council. The IROC will provide stakeholders a venue for influencing the development of the City's urban runoff management programs, including the Mission Bay WURMP.

4.3.4 Mission Bay Park Committee

The Mission Bay Park Committee advises the Park and Recreation Board of the Park and Recreation Department on the development, utilization, and policies regarding Mission Bay Park. The Committee meets once a month and provides a venue for the public and the Storm Water Division to discuss issues related to urban runoff management pertaining to the park. In the past, for example, the Storm Water Division made a presentation to the committee on the findings of a bacterial source identification study on Mission Bay, which was followed up with the construction of the Mission Bay Computerized Irrigation System Project designed to reduce over-irrigation in the park conveying bacteria-laden bird wastes into the bay. The City will continue to use this venue to engage stakeholders in the WURMP, especially with regards to project implementation.

4.3.5 Project Clean Water

Project Clean Water, which was initiated in July 2000, established a framework for the broad-based and collaborative development of solutions to local water quality problems. The relationship of Project Clean Water policies to Municipal Storm Water Permit compliance is important. An underlying tenet of this effort is that Municipal Storm Water Permit compliance alone cannot achieve clean water. As such, Project Clean Water seeks to actively involve a multitude of stakeholders in exploring water quality problems, their causes, and their solutions. This significantly broadens the base of stakeholder input available to consider issues directly related to Municipal Permit compliance. As with Copermittee meetings, all Project Clean Water meetings are open to the public and participation is encouraged through a variety of avenues including a website, electronic notifications, and personal phone calls.

To provide information on meetings, work products, and other valuable links to the public and interested parties, a Project Clean Water website¹ is maintained. Interested parties have extensively utilized the site to post various work products for review and comment. It is the goal of Project Clean Water to establish this site as a centralized source of water quality information for the San Diego region.

¹ <http://www.projectcleanwater.org>

The Mission Bay WURMP and annual reports are placed on the website to allow stakeholders to view the documents and submit comments. The City will continue to use Project Clean Water as a vehicle to update stakeholders and encourage feedback as it continues to develop and implement the WURMP.

4.3.6 Think Blue Website

The City's Storm Water Division maintains the Think Blue website². It is available to the public and professional organizations as a resource to help them be compliant with urban runoff regulations and to educate themselves on urban runoff issues and solutions. BMP fact sheets in both English and Spanish and bacterial source identification studies are available online. The Storm Water Division has also posted the Mission Bay WURMP on the website, as well as the annual reports to provide stakeholders the opportunity to review and comment on the documents. In addition, solicitations for public participation in meetings and outreach events are posted on the website. The City will continue to use this venue to encourage stakeholder participation in the development and implementation of the Mission Bay WURMP.

4.4 Proposed Land Use Planning Activities

The City is divided into various politically recognized communities, each with its own community plan prepared by the City Planning & Community Investment Department that implement the planning policies in the City's General Plan. The Mission Bay WMA encompasses nine communities: Linda Vista, Clairemont Mesa, Kearny Mesa, Mission Beach, Pacific Beach, La Jolla, University City, Mission Bay Park, and MCAS Miramar. Of these, seven have community plans (Mission Bay Park and MCAS Miramar are covered under other planning documents). Each community plan is updated periodically to reflect changes in the community, as well as provide fresh direction regarding growth and development. For example, the California Coastal Commission approved the La Jolla Community Plan update in FY 2004, and City staff began its implementation in FY 2005. The La Jolla Community Plan includes extensive storm water policies pertaining to coastal bluffs and steep hills. The City will use the community plan update process to incorporate urban runoff management principles into the plans, as needed, to address special concerns identified for the Mission Bay WMA.

² <http://www.thinkbluesd.org>

Section 5 Effectiveness Assessment

This section outlines the framework that the City will be using to assess the effectiveness of its efforts at improving the surface water quality of the Mission Bay WMA at two levels: at the program level and at the activity level. The City believes that effectiveness assessment begins at the top and works its way to the bottom. In other words, broad management objectives, such as those presented in Section 1.1.4, aspired to with an eye towards resource maximization, cost efficiency, and effectiveness maximization, guide how the program as whole would be assessed, which in turn directs how the individual activities would be evaluated in order to be able to make conclusions as to whether or not the management objectives have been met. Assessment is part of the iterative approach of planning, implementation, and assessment, in which findings from the assessment feed into planning and implementation to ever improve the program and individual activities.

5.1 Watershed Activities

The Activity Summary Sheets in Section 4 contain information regarding how each activity will be assessed to determine its effectiveness protecting and improving water quality. This section outlines the general principles of water quality activity assessment that the City will be using.

5.1.1 Water Quality Activities

The City will use the Assessment Pyramid collectively developed by the Copermittees in 2003 to assess each watershed water quality activity. The City will determine at which levels it would be feasible to assess each activity and indicate them on the Activity Summary Sheets. Some activities, such as targeted street sweeping, lend themselves to levels 1, 3, 4, and 5 assessment, while others, such as trash/debris cleanups and targeted facility inspections, are only mostly suitable for assessment at levels 1 and 4.

Once proper assessment levels are determined, the City will then determine what measurable targeted outcomes, assessment measures, and assessment methods would need to be established to enable assessment at the identified levels. For example, in order for assessment of targeted street sweeping at level 4 (load reduction) to be possible, it may be determined that City would need to establish a mechanism or process to track the amount of debris/pollutants collected (measurable targeted outcome) by weighing (assessment method) in tons (assessment measure) the debris/pollutants, before disposal at the landfill and analyzing in a laboratory, representative grab samples (assessment method) of the debris to estimate the amount of metals removed from City streets.

The City may decide to coordinate its standing monitoring programs, in addition to developing ad hoc monitoring programs, with its activities to assess the effectiveness of the activities. For example, dry weather monitoring stations may be arranged to capture flows determined to be coming from the activity vicinity should there be any. That data and upstream data may then be compared to see the effects of the activity on runoff quality. The City will try to coordinate its activity assessment with its standing monitoring programs as feasible to maximize resources and achieve efficiencies.

5.1.2 Education Activities

Similar to water quality activities, the City will also use the Assessment Pyramid to assess each watershed education activity. The City will determine at which levels it would be feasible to assess each activity and indicate them on the Activity Summary Sheets. For the most part, education activities, such as distribution of flyers and brochures, lend themselves to levels 1 and 2 assessment only. However, assessment at other levels, such as 3 and 4, may be possible if the education activities are followed up with inspections and enforcement. The City will determine the appropriate and feasible levels of assessment for each education activity.

Once proper assessment levels are determined, the City will then determine what measurable targeted outcomes, assessment measures, and assessment methods would need to be established to enable assessment at the identified levels. For example, in order for assessment of television and radio advertisements at levels 2 and 3 (changes in knowledge/awareness and behavioral change/BMP implementation, respectively) to be possible, it may be determined that City would need to establish a mechanism or process to track urban runoff pollution awareness (measurable targeted outcome) by conducting two (measurable targeted outcome) random-digit dialing telephone survey (assessment method) using appropriate questions (assessment measure) and statistically analyzing the results (assessment method) of the survey to determine the effect of the television and radio advertisements on the public's awareness of urban runoff issues. Follow-up inspections (assessment method) of selected areas may be conducted to determine changes to BMP implementation levels (measurable targeted outcome) attributable to the advertisements.

The City may decide to coordinate its standing monitoring programs, in addition to developing ad hoc monitoring programs, with its activities to assess the effectiveness of the education activities. For example, dry weather monitoring stations may be arranged to capture flows determined to be coming from the activity vicinity should there be any. That data and upstream data may then be compared to see the effects of concentrated brochure distribution and outreach within a specified area on runoff quality. The City will try to coordinate its activity assessment with its standing monitoring programs as feasible to maximize resources and achieve efficiencies.

5.2 Programmatic Assessment

The City will use the following questions to assess qualitatively and quantitatively the Mission Bay WURMP as a whole:

- *Is the City making progress towards achieving its program goal and objectives in a way that maximizes resources, is cost effective, and achieves the maximum water quality benefit possible?* The answer to this question will be based on a review of the City's efforts as they relate to the objectives, a review of the water quality data to determine if water quality is being positively affected, and review of WURMP-related expenditures.
- *How well has the City maximized the effectiveness of individual activities?* The answer to this question will be based on the effectiveness assessment results for the individual watershed activities. A positive answer to this question will indicate that the City has

been successful in identifying and implementing feasible activities that positively affect water quality, which are the building blocks to an effective program.

- *Is the City seeing an improvement in the water quality (both of urban runoff/discharge and of receiving waters) of the WMA as shown through its annual water quality assessment (Section 3)?* The answer to this question will be based on the City's annual water quality assessment of the Mission Bay WMA and the Threat to Water Quality (TTWQ) ratings for the WMA in future LTEA reports. The annual water quality assessment will enable the City to observe trends and the like. A downward trend, coupled by implementation of effective activities, for example, can be an argument that the WURMP is having a positive effect on water quality.

As for use of the TTWQ rating system, if, for example, the City observes that the TTWQ ratings for a particular source of a certain pollution in the Mission Bay WMA has improved even though the watershed's alphabetic (A–D) water quality priority rating in the LTEA as to that pollutant has remained fairly stable, then it can compellingly conclude that its activities have positively changed the discharge quality of that source (Level 5 assessment). If the City observes that the TTWQ rating of all the sources of a particular pollutant in the WMA have improved even though it has only been aggressively targeting only one of the sources or has focused its resources primarily on end-of-pipe BMPs, then it can compellingly conclude that its activities have positively changed receiving water quality (Level 6 assessment).

- *Is the City effectively targeting identified pollutant sources of the identified high priority water quality problems?* The answer to this question will be based on its source identification studies and watershed-based facility inspection program. The results of these efforts will enable the City to focus its resources on the most problematic sources and causes to achieve the best bang for its buck. The combination of effective activities, favorable water quality trends, and adequately characterized and targeted pollutant sources will enable the City, for example, to conclude that its program is being effective in protecting and improving water quality.

The City feels that programmatic assessment is best a long-term effort of rigorous scientific information collection over several years. As more data are compiled throughout the years, the City will be able to make better programmatic assessments that will help it refine its WURMP.

5.3 TMDL BMP Implementation Plans

No Total Maximum Daily Loads (TMDLs) are currently in effect for the Mission Bay WMA. However, the following water bodies in the WMA are currently listed as impaired per Section 303(d) of the Clean Water Act:

- Mission Bay: Bacteria indicators, lead, eutrophication
- Tecolote Creek: Bacteria indicators, cadmium, copper, lead, zinc, toxicity

As TMDLs are developed to address the issues for the above water bodies, the City will work to integrate TMDL activities with WURMP activities to maximize resources and achieve efficiencies. TMDL efforts affecting the Mission Bay WMA will be described in the section and reported in the Mission Bay WURMP annual reports.

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Section 6 Conclusions and Recommendations

6.1 Conclusions

The City will continue to refine and augment the Mission Bay WURMP over the long term as it perfects its understanding of the complex issues affecting the Mission Bay WMA. Such refinement and augmentation are supported by the iterative process used to develop and implement the WURMP, which establishes mechanisms for stakeholders to evaluate priorities, improve coordination, assess program goals, and allocate finite resources in a cost-effective manner.

Adaptive management is key to making the iterative process work. Adaptive management allows adjustments in management direction as new information becomes available. The combination of natural variability in the hydrologic cycle and the uncertainty associated with a complex system requires that watershed managers be flexible enough to modify implementation approaches based on progress and available information. Watershed characteristics, sources of pollutants, and management approaches are unique, and, therefore, management efforts may not proceed exactly as planned. Adaptive management does not mean that the watershed's water quality goals would be modified based upon lack of progress, but that the results would be used to modify management policies, strategies, practices, and operation and maintenance procedures to reach goals.

Even though priorities are being addressed in a focused manner, it still takes time for management activities to produce quantifiable improvements in water quality. As such, the WURMP includes performance measures and a review mechanism. Performance data collected in subsequent cycles will be used to determine the effectiveness of previous management activities.

The Mission Bay WURMP presents part of the City's long-term efforts to protect and enhance the water quality of the WMA using a watershed-based approach. The WURMP will continue to be developed with stakeholder participation and be integrated with other non-City projects, as appropriate.

6.2 Recommendations

The following presents the City's broad recommendations on continued refinement of the Mission Bay WURMP:

- **Expand Knowledge of Pollutant Sources.** The most important contribution the WURMP can make towards protecting and improving water quality in Mission Bay is to expand understanding of the water quality issues in the WMA (i.e., the pollutant sources and magnitude of the issues), so that the City, other entities, and interested members of the public (its watershed partners) can make more informed decisions and actions. The City's approach for increasing its level of understanding involves two prongs:

1. *Continue to gather additional water quality monitoring data suitable for conducting assessment at the watershed and subwatershed levels.* In order to effectively assess water quality at both the watershed and subwatershed levels, additional monitoring during both the dry and wet seasons is needed throughout the WMA so that priority water quality problems may be accurately identified, characterized, and prioritized.
2. *Continue to research and characterize pollutant sources and their loading potential.* A more positive identification of sources and their loading potential would allow the City to modify program activities wisely and devote scarce resources to target specifically the most troublesome sources using the most efficient BMPs.

To address the above, the City will continue to coordinate with its Copermittees to identify and fill data gaps. Already the Model Watershed Strategy contributes to addressing this issue by guiding the Copermittees through a process that identifies HAs within the WMAs that need additional monitoring and source characterization activities before load reduction and source abatement activities can be implemented in those HAs.

To follow up on the data gaps identified by going through the Model Watershed Strategy, the City will continue with the other Copermittees to implement a coordinated program of source identification studies. Section 4 of this WURMP describes the watershed-based facility inspections that the City plans on implementing. Data gathered from these inspections can be used to better characterize sources.

In addition, the Copermittees are set to augment their jurisdictional and collective monitoring programs to address new Municipal Storm Water Permit requirements. This augmentation will further help the City characterize the Mission Bay WMA.

- **Refine and Improve Focused Water Quality Activities.** The City is continually developing and refining its list of watershed activities. Table XXX in Section 4 of this WURMP represents the City's plan to address the current priority water quality problems in the WMA. Of course, implementation of some of these activities is ultimately subject to funding availability and to modifications based on the results of water quality and effectiveness assessment yet to be performed. The City will use the best available data to refine and improve its watershed activities.
- **Refine and Improve Effectiveness Monitoring.** The Copermittees have made great strides in assessing the effectiveness of their WURMPs with the formulation of Assessment Pyramid and the LTEA process. These work products provide the structure and methodology for assessing the efficacy of the various WURMPs. However, true effectiveness assessment can only be achieved if sufficient data collection is conducted to allow for before-and-after activity implementation comparisons. The City will continue to work with its Copermittees to refine and improve their effectiveness monitoring both at the activity and programmatic levels to permit substantive effectiveness assessment. Information on activity-specific effectiveness measurements can be found in Section 4 of this WURMP as part of the Activity Summary Sheets.

6.3 WURMP Update Process

Progress on the implementation of the Mission Bay WURMP will be assessed each fiscal year, and the results will be documented in an annual report following a regionally standardized table of contents and to be appended to this WURMP. The annual report will describe and justify any changes to the WURMP.

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